ABSTRACT

A device is provided for enhancing the sensitivity of a microsensor (or any other micro device) by providing on-line preconcentration. A microconcentrator is provided on a silicon substrate that can be integrated with a sensor or a micromachined GC to enhance the signal to noise ratio. In one embodiment the microconcentrator comprises a miniaturized sorbent trap fabricated on a microchip. In a preferred embodiment the microconcentrator is made on a silicon substrate so that a sensor can be integrated on the same chip. In practice the microconcentrator is put on-line with a sample stream and may be operated at a fixed frequency. The microconcentrator is composed of at least one microchannel etched in silicon. The channel is lined with a microheater for in-situ heating. In a most preferred embodiment preconcentration is done on a thin-film polymeric layer deposited above the heater in the channel. Rapid heating by the channel heater generates "desorption pulse" to be injected into a detector, or, a sensor. In another embodiment the microconcentrator is a concentrator-injector for a gas chromatograph.